

# INTERNATIONAL SEARCH REPORT

International Application No  
PCT/JP2005/001284

## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	'Online! 2002, XP002320444 Retrieved from the Internet: URL:koho.osaka-cu.ac.jp/vuniv2002/material s2002/ Lec_tani/manus_tanigaki/IVcluster.doc> 'retrieved on 2005-03-08! page 4, line 28	1,12
A	KAWAGUCHI, TANIGAKI YASUKAWA: "silicon clathrate with an f-electron system" PHYS. REV. LETT., vol. 85, 2000, - 2000 pages 3189-3192, XP002320445 the whole document	1,12
X	YANG LI, JI CHI, WEIPING GOU, SAMEER KHANDEKAR, JOSEPH H ROSS JR: "Structure and stability of Ba-Cu-Ge type clathrates" JOURNAL OF PHYSICS: CONDENSED MATTER, vol. 15, 1 August 2003 (2003-08-01), pages 5535-5542, XP002341687	3,14
X	page 5535, lines 3-11	3,14
X	J.D.BRYAN, V.I. SRDANOV, G.D.STUCKY: "superconductivity in germanium clathrate Ba <sub>8</sub> Ga <sub>16</sub> Ge <sub>30</sub> " PHYSICAL REVIEW B, vol. 60, no. 5, 1 August 1999 (1999-08-01), pages 3064-3067, XP002341688	3,14
X	page 3064 - page 3067	3,14
X	J.D. BRYAN, N.P. BLAKE, H. METIU, G.D.STUCKY: "Nonstoichiometry and chemical purity effect in thermoelectric Ba <sub>8</sub> Ga <sub>16</sub> Ge <sub>30</sub> clathrate" JOURNAL OF APPLIED PHYSICS, vol. 92, no. 12, 15 December 2002 (2002-12-15), pages 7281-7290, XP002341747	3,14
X	the whole document	3,14
X	B.C. SALES, B.C. CHAKOUMAKOS, R. JIN, J. R. THOMPSON, D. MANDRUS: "structural, magnetic, thermal, and transport properties of X <sub>8</sub> Ga <sub>16</sub> Ge <sub>30</sub> (X= Eu,Sr,Ba) single crystals" PHYSICAL REVIEW B, vol. 63, 6 June 2001 (2001-06-06), pages 245113-1-245113-8, XP002341748	3,14
X	abstract	3,14

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<b>A. CLASSIFICATION OF SUBJECT MATTER</b> IPC 7 C01G17/00 C01G7/00 C01F11/00 C01G55/00 C01G3/00 C01G5/00		
According to International Patent Classification (IPC) or to both national classification and IPC		
<b>B. FIELDS SEARCHED</b> Minimum documentation searched (classification system followed by classification symbols) IPC 7 C01G C01F		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched		
Electronic data base consulted during the international search (name of data base and, where practical, search terms used) EPO-Internal, PAJ, WPI Data		
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	"Electronic structure of Si and Ge gold-doped clathrates" PHYS. REV. B, vol. 60, no. 19, 15 November 1999 (1999-11-15), pages 13245-13248, XP002320442 abstract	1, 12
X	----- HERRMANN TANIGAKI ET AL: "Germanium clathrate with d-transition element" PHYS. REV. LETT., vol. 74, 1995, page 1427, XP002320443 the whole document ----- <div style="text-align: center;">-/--</div>	1, 12
<div style="display: flex; justify-content: space-between;"> <span><input checked="" type="checkbox"/> Further documents are listed in the continuation of box C.</span> <span><input type="checkbox"/> Patent family members are listed in annex.</span> </div>		
<div style="display: flex;"> <div style="flex: 1;"> <p>* Special categories of cited documents:</p> <p>*A* document defining the general state of the art which is not considered to be of particular relevance</p> <p>*E* earlier document but published on or after the international filing date</p> <p>*L* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)</p> <p>*O* document referring to an oral disclosure, use, exhibition or other means</p> <p>*P* document published prior to the international filing date but later than the priority date claimed</p> </div> <div style="flex: 1;"> <p>*T* later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention</p> <p>*X* document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone</p> <p>*Y* document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.</p> <p>*Z* document member of the same patent family</p> </div> </div>		
Date of the actual completion of the international search  <div style="text-align: center;">23 August 2005</div>	Date of mailing of the international search report  <div style="text-align: center;">19. 09. 05</div>	
Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Authorized officer  <div style="text-align: center;">Arnotte, E</div>	

## FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

## 1. claims: 1,12

Claim 1 relates to a clathrate compound having the following formula:  
Ba8 Aua Ge46-a  
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## 2. claims: 2,3,4,13,14,15

Claim 2 relates to a clathrate compound having the following formula:  
Ba8 Aub Gac Ge46-b-c  
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## 3. claims: 5,16

Claim 5 relates to a clathrate compound having the following formula:  
Ba8 Ptg Ge46-g  
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## 4. claims: 6,7,17,18

Claim 6 relates to a clathrate compound having the following formula:  
Ba8 Pdh Ge46-h  
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## 5. claims: 8,19

Claim 8 relates to a clathrate compound having the following formula:  
Ba8 Ak Gal Si 46-k-l with A representing Pd or Pt  
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## 6. claims: 9-11,20-22

Claim 9 relates to a clathrate compound having the following formula:  
Ba8 Em Ga6-m Ge40 with E representing Cu or Ag  
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## Box II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This International Search Report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☒ Claims Nos.: 2-11, 13-23  
because they relate to subject matter not required to be searched by this Authority, namely:  
see FURTHER INFORMATION sheet PCT/ISA/210
2. ☐ Claims Nos.:  
because they relate to parts of the International Application that do not comply with the prescribed requirements to such an extent that no meaningful International Search can be carried out, specifically:
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

## Box III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

see additional sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this International Search Report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☒ As only some of the required additional search fees were timely paid by the applicant, this International Search Report covers only those claims for which fees were paid, specifically claims Nos.:  
1-4, 12-15
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this International Search Report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☒ No protest accompanied the payment of additional search fees.